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TELEPHONE ENGINEERING INFORMATION

These information letters are intended to provide a means for answering questions that arise in the field and to inform the field of new developments. They are not intended to be instructions nor to replace in any respect the approved channels for establishing requirements and procedures.

TE and CM Sections Distributed Since Letter No. 27, dated July 1961

Add. 1, TE&CM-325, Application Guide for Preparation of Detail Dial Central Office Equipment Requirements, August 1961

Add. 1, TE&CM-615, Design of Open Wire Plant, August 1961

New, TE&CM-636, Aerial Cable Plant Assembly Units, August 1961

New, TE&CM-445, How to Make Structural Return Loss Measurements, September 1961

New, TE&CM-620, Design and Construction of Figure 8 Distribution Wire, October 1961

New, TE&CM-619, Design and Construction of Insulated Open Wire Plant, October 1961

Rev. TE&CM-444, Calculation of Net Loss of Negative Impedance Repeatered, Loaded Trunks, November 1961

Add. 2, TE&CM-510, Telephone Traffic - Dial Central Office Equipment Switch Quantities, January 1962

Rev. TE&CM-302, Power Requirements for Community Dial Central Office Equipment, January 1962

Rev. TE&CM-210, Telephone System Design Criteria, Engineering Time Periods, January 1962

Rev. TE&CM-635, Construction of Aerial Cable Plant, February 1962

Telephone System Construction Contract, REA Form 511 has been revised. It should be available for purchase from the Superintendent of Documents, U. S. Government Printing Office, May 15, and is expected to be required on all construction bids received after July 15. It will provide details on the construction of Figure 8 aerial distribution wire, also on the "extra long" span insulated line wire construction. The old style unsheathed aerial distribution wire construction details have been deleted.

Alumoweld Strand and Bare Line Wire were placed in Mariana, Pennsylvania, about 30 months ago. The strand was 16M and the line wire was 0.128 inch diameter. This installation was recently inspected and it was found that the atmoshpere which is corrosive because contaminated by fumes from slag pile fires and coal mines has caused no evident corrosion of these aluminum coated steel products.

The "UR-19/26" M. M. & M. Company Bridging Connector has been accepted for use by REA borrowers. This is a metallic device encased in plastic and filled with silicone grease for moisture-proofing which can be placed over a plastic insulated cable conductor and into which a bridging plastic insulated conductor such as a wire to a connecting block in a ready-access enclosure can be inserted. A pressure tool designed for the purpose can then be applied to the connector and the metal inside the connector forced into connection with the cable conductor and the bridging wire without requiring the cable conductor to be cut. It is satisfactory for cable and bridging conductors of 19, 22, 24, or 26 gauge.

A Bonding Harness is available for use in buried plant terminal housings for connecting together the shields of the cables entering the housing and to ground them to the pedestal through its metal frame. The tinned copper bonding wire has pinch type clips which can be closed with a compression tool for attaching to cable shields and a capped end designed for insertion in the split bolt grounding connector of the terminal housings.

Buried Wire and Cable Placing Plows of different types vary in their suitability for making satisfactory installations. A revision of TE&CM-641, "Construction of Buried Plant," is in preparation explaining the plow requirements.

New TE&CM-670, "Corrosion Considerations in Outside Plant," is in the final stages of preparation and should be available from the printer early in April 1962.

Galvanized Steel Ground Rods with a copper wire pigtail soldered to them have been accepted for REA borrowers' use. They are required for use where galvanic action is a problem. The galvanic problem is discussed in TE&CM-670. Because of a price differential, it is expected the galvanized rods will be furnished in new construction unless otherwise specified.

A New 18-Gauge Copper Drop Wire has been under development and specifications prepared on it. A field trial is to be made soon. This drop wire has the copper conductors as a twisted pair encased in high density polyethylene. An 0.084 inch galvanized steel support wire lies parallel to the copper conductors and the whole structure is encased in polyvinyl chloride. The wire will be cheaper than presently used drop wires and

has the further advantage of requiring much less sag. It provides for considerably more clearance over highways and this may result in avoiding some pole replacements to provide road clearance.

New High Strength Line Wire is now available, use of which will be covered in a revision of TE & CM-615, "Design of Open Wire Plant." This wire will permit spans in the order of 500 to 600 feet in the heavy loading district. Pin spacings can be 10 or 12 inch for this bare wire with tensions sufficient to provide adequate insurance against midspan hits. This type of construction, called "intermediate" span length type, will result in reducing the average number of poles per mile in the heavy loading district from 18 to 12 per mile. The associated crossarm, pin, insulator, pole hardware and labor costs will be considerably less per mile than with the shorter spans.

A New and Improved Polyethylene has been adopted for use as wire insulation and will be required on one-pair and multipair Figure 8 aerial distribution wire, on single conductors for insulated line wire construction, and on outside-inside station wire after April 1, 1962. It is called "high density" polyethylene. It replaces "high molecular weight" polyethylene. Its use is being considered for the insulation on cable conductors. It is about ten times as hard as the "high molecular weight" polyethylene, and is forty to fifty times more abrasive resistant. The difference in hardness can be detected by attempting to strip the insulation from a wire. It is quite difficult to strip off by thumb nail test whereas the older high molecular weight can be stripped easily. It is slightly more expensive than the high moledular weight polyethylene but should result in little difference in the price of finished products.

Frost Heaving of Buried Cable Pedestals has occurred frequently enough to warrant attention to the problem. The pedestals may rise enough to pull the cable loose from its taped attachment to the bar at the top of the pedestal and break connections to terminal blocks. Pending revision of PC-2 splicing specification, it is suggested that where a single terminal block is used it be mounted lower on the mounting bracket in order to leave more slack in its connecting wires and that the cable conductors be rather loosely taped to the crossbar at the top of the mounting bracket.

Newly Designed BD1A Terminal Housing - Pole Mounted has been accepted for use of REA borrowers to replace the formerly accepted design. It is a lower cost design intended for use with cable up to 6-pair size and to accommodate buried wire.

Transistorized Ringing Generators. Two field trials have been authorized for the Lorain LT-15 generator on which preliminary investigations were encouraging. The Stromberg-Carlson RG 525 generator is on trial in one installation. Complete test data has not yet been received on this. It has a novel standby arrangement. This provides that if anyone of the five frequencies of the main generator fails an emergency unit cuts in on the frequency that failed, leaving the other frequencies operating from the main generator.

Laboratory Equipment recently received is now in use. This includes a humidity chamber and an oven. The humidity chamber can make tests on materials from 0° to 200° F. The oven can make tests at temperatures from 32° to about 600° F. These devices will assist the staff in determining the acceptability of various plant items. The electrical testing laboratory of the REA Electric Program organization also is used here at headquarters for applying high current or high voltage testing on telephone system items.

Panhandle X Cable Carrier Installation in the system of the Shenandoah Telephone Company, Edinburg, Virginia, Virginia 517, has been evaluated. This is the first evaluation by REA of this particular equipment. The installation totals 35 channels, 10 with E and M trunks and 25 two-way loop dial EAS trunks. The use of two-way loop dial trunks means substantial savings in central office equipment. The carrier is connected directly to the outgoing selectors and incoming trunk selectors and eliminates the need for central office trunk terminations which cost about $135 per termination. Two-way loop dial signaling is something relatively new in carrier. Heretofore, one-way loop dial signaling has been used economically, however, it provides only one-way trunk groups. By the use of two-way trunks there is economy in that directional trunk groups are not necessary.

Stromberg-Carlson 661 Transistorized Subscriber Carrier installed in the system of the Merchants and Farmers Telephone Company, Montpelier, Virginia, Virginia 507, was inspected in December. It is used on lines comprising cable and open wire. This 661 is a 12 channel system and repeaters are available to extend the range through cable facilities. It is operating satisfactorily, and a final evaluation will be made in June after it has been in service a reasonable length of time.

Panhandle X Subscriber Carrier for All-Buried Plant installed at Conway, South Carolina, by the Horry Telephone Cooperative, South Carolina 519, was put in service in February 1962. The plant in this area is all buried because of the serious corrosive effects due to its nearness to the seacoast and its salt atmosphere. The cable used was specially designed for carrier for several systems under one sheath which use frequencies up to 336 K-C. Repeaters are spaced along the cable at 20 d-b intervals (at 336 K-C). These are all powered from the central office battery and a power supply at the subscriber terminal of the system. There are 20 channels working. The ultimate capacity of the cable is 80 channels or 4 carrier systems. The terminal equipment is located in a hut. The installation is working satisfactorily. An evaluation visit is planned for the end of March.

The Lenkurt 81A Trunk Carrier installed in the plant of the Horry Telephone Cooperative, Conway, South Carolina, South Carolina 519, was recently put in service. It was placed in service at the same time as the Panhandle subscriber carrier mentioned above. Repeaters are spaced along the cable at 20 d-b intervals (400 K-C) and are all powered from the central office battery over the same pairs which haul the carrier frequencies. This carrier will be evaluated at the end of March 1962.

VF Repeaters of four makes are being field tested. The Stromberg-Carlson 546 negative impedance repeater Type E-23 is under test in the system of the Hillsdale County Telephone Company, Pittsford, Michigan, Michigan 528. The ITT-Kellogg KE-6 V.F. Repeater is under test in the system of the Wikstrom Telephone Company, Minnesota 520, at Newfolden, Viking, and Holt, Minnesota. This is a transistorized negative resistance type having improved characteristics over the older E-23 negative impedance type and is lower in cost. The Hallamore R-612 and the Altec-Lansing 7200 VF repeaters are also under field test. Both of these repeaters are of the hybrid (V) type. The Hallamore repeater can be operated on a 2 wire to 2 wire basis only. These repeaters are under test in the system of the Shenandoah Telephone Company, Edinburg, Virginia, Virginia 517. These installations will be evaluated and recommendations will be made regarding their usage.

Dial Mobile Radiotelephone of ITT-Kellogg manufacture is under field trial at the Headwaters Telephone Company, Rhinelander, Wisconsin, Wisconsin 536. The signaling equipment used by Kellogg is manufactured by Secode and is compatible with the Bell manual mobile telephone signaling into the vehicle. The radio equipment uses single conversion superheterodyne receivers with a 10.7 MC I.F. and a crystal filter. This is a departure from the general design which uses dual-conversion receivers.

Dial Mobile Radiotelephone of Lenkurt manufacture is undergoing final tests at the Dakota Telephone Cooperative, Irene, South Dakota, South Dakota 515. This system uses General Electric radio equipment with Lenkurt's own type of signaling.

Dial Mobile Radiotelephone equipment manufactured by Dumont is expected to be placed on the market in the near future. This company has recently been working with REA to make a product to meet present specifications.

Dial Mobile Radio Telephone of A.C. Spark Plug is a newcomer in the mobile radio field. They have been advertising a dial mobile radiotelephone unit. However, this company has since announced that it was discontinuing manufacture of commercial products and that its mobile radiotelephone line would be carried by the Delco Division of General Motors.

Central Office Heat Coil Elimination has been decided upon. It has been determined that main frame heat coils serve no useful purpose. It is the desire to have main distributing frames designed without them. The Central Office Specifications are being revised to reflect the decision. Switchboard suppliers will have the option of supplying heat coils during a transition period.

Long Line Adapter Booster Power Supply intended to extend the adapter transmission range will be included in the next issue of the Central Office Equipment Specification. The cost is likely to range from $200 to $500. The desire is to assure at least twenty-three mils of current to 500 type telephones on the longest loop permissible with the adapters. The idea involves the addition of 24 volts in the tip side of the line at the adapter. Ballast lamps, or equivalent, will be used in this power supply to limit the current to the other telephones along a circuit, which may be close to the adapter and to protect in case of circuit faults.

A North Electric NX-2 Crossbar Dial Central Office, a 600 line board, installed by the North Star Telephone Company, Incorporated, Minnesota 590, at Mountain Lake, Minnesota, was cut over in November 1961. It is the largest board of this type installed by an REA borrower.

Minneapolis and Memphis Symposia for borrowers' consulting engineers and REA field engineers were held in late November and early December 1961. The previous such meeting was held in March 1958. The consensus resulting from the recent meetings was that they were very beneficial and should be held more frequently, with eighteen months as the suggested intervals.

National Electrical Safety Code, 6th Edition was issued by the U. S. Department of Commerce as National Bureau of Standards Handbook 81, dated November 1, 1961. It can be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. - price $1.75 per copy. Each field engineer has been supplied with a copy. The changes made should result in reduced construction costs. In states where the 5th edition is in effect by law will require that the older edition be continued as a guide until these states adopt the new edition.